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ARE THE SPECIES OF RHIPSALIS DISCOVERED IN AFRICA INDIGENOUS?

BY R. ROLAND-GOSSELIN*

There have been several species of *Rhipsalis* described, from the African continent, from Zanzibar, Madagascar and the Mascarene Islands. Most of these exist living in our collections and it has now become possible, after a comparative study, to form an idea as to their being indigenous or imported, by way of the ocean, from America.

I have possessed for fifteen years adult examples of all of Weber's species, with labels written in his handwriting, by the aid of which I feel able to make careful comparisons on account of the authenticity of his types.

Weber described in the *Revue hort.* 1892:

Rhipsalis madagascariensis.
suareziana.
comorensis.
zanzibarica.

K. Schumann described (*Monogr. Cact.* p. 603):

Rhipsalis erythrocarpa.

Welwitsch described a *Rhipsalis aethiopica* from Angola, and Commerson found on the island of Mauritius *Rhipsalis mauritiana* and *fasciculata* Haw.

If to this list we add *Rhipsalis Cassutha* Gaertn. which is as common in Africa as in America, and which has also been collected in Asia at Ceylon, I shall have mentioned all the species of *Rhipsalis* actually known in the flora of the Old World.

* Bull. Soc. Bot. France 59: 97-102. 1912. Presented January 12, 1912.
Translation by E. G. Britton,

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Four of these must be regarded as synonyms of *Rhipsalis Cassutha* Gaertn. They are:

Rhipsalis aethiopica Welwitsch.
mauritiana Commerson.
zanzibarica Weber.
comorensis Weber.

This fact is not contested by anyone for the first two species.

As Weber describes it, his *R. zanzibarica* sent from Zanzibar to the Museum in 1888 by Father Sacleux is also a form of *R. Cassutha* but very vigorous and identical with a fine specimen collected at Xalapa, Mexico, by M. Leon Diguët in 1907, bearing fruits somewhat elongated as in *R. zanzibarica*. In a large number of specimens of *R. Cassutha* from different localities the fruits may be seen quite spherical.

Rhipsalis comorensis, in which the flowers, fruits and seeds are like those of *R. Cassutha*, is distinguished by the vegetative parts being slightly thickened. The branches are not very long and consequently less pendent. The young specimens have the aspect of *R. conferta* S. D. but the flowers are completely different.

Weber in the "Dictionnaire de Bois," p. 1046, considers his *R. madagascariensis* as a synonym of the old *R. fasciculata* Haw. indicated by P. de Candolle and Lamarck as originating in Sto. Domingo and adjacent islands.

The figures given by the Botanical Magazine (no. 3079) and by Redouté in the Plantes Grasses of P. de Candolle represent the American plants, identical with those specimens from Africa which we possess. According to their origin these vary in size. The type of Tamatave which Weber used for his description is slender and sometimes languishes in our green-houses, whereas the one introduced from Madagascar by Sainte-Marie in 1898 is larger and more robust. This species preserves its juvenile form during many years, the stems are covered with many small white setaceous spines; usually on the adult branches there arise juvenile branchlets bearing flowers. I do not know the authentic specimen from Mascarene Islands.

De Candolle believed that he recognized *Rhipsalis fasciculata*

in the figure of the manuscript of Plumier bearing the name "*Opuntia minima flagelliformis*." Haworth mentions also this drawing but says: "figura vero Plumeri valde dissimilis," and he has very good reason. The species of Plumier is not *Rhipsalis fasciculata*, and could very well be the lost species, described by Pfeiffer, by the name of *undulata*.

The existence on the American continent of *Rhipsalis fasciculata* Haw. is not proven, and it is remarkably curious that it has not been found except on the Islands of America and Africa, near the sea in the latter part of the world.

Rhipsalis suareziana Web. which the author has denominated *suarensis* in the "Dictionnaire de Bois," is a very characteristic plant, belonging to a group having lateral inflorescence, with exserted ovary and branches of two forms. At the extremity of the branching, elongated cylindrical stems, which have spacious areoles and almost naked, there grow in a spiral series a large number of very short branchlets 4 or 5 together, with areoles crowded and setiferous, which are not floriferous, and do not produce buds for further ramifications. Weber has not described the flower except briefly in the Dictionnaire, and one very important character escaped him. The stigma is bifid, or in very rare exceptions 3-4-fid and this number of divisions cannot be frequent in the genus, for I have not observed it in other species.

At the same time that he described this African plant, Weber described (Rev. hort. 1892) a *Rhipsalis* of which he did not know the origin, but which we have since received from Brazil, under the name of *Rhipsalis tetragona*. In the Dict. de Bois. p. 1046 he indicates its resemblance to *R. suareziana* and described the flower as small and lateral with obovate recurved petals.

I should remark here that the plant described and figured in flower at Berlin by Gürke (Monat. für Kakteenkunde, 1908, p. 74) under the name of *Rhipsalis tetragona* Web. has not the least analogy with this species. The German plant belongs without doubt to the group of *Rhipsalis cribrata*, *R. Saglionis*, etc., with terminal, subcampanulate flowers, whereas Weber's species bears very small lateral flowers similar in all respects to those of

Rhipsalis suareziانا. Furthermore, I found here also the bifid stigma which I observed on the plant of Diego-Suarez.

The more I observe and compare the two plants, the more firmly convinced I am that they belong to one and the same species.

I have failed thus far, in my researches, to find *Rhipsalis* (*Hariota*) *prismatica* Lem. from Brazil (Ill. Hort. 1863) which Weber supposed to be a synonym of his *Rhipsalis tetragona*. Lemaire's species seems to be absolutely lost.

Rhipsalis erythrocarpa K. Sch. (Monogr. Kact. p. 623) is a species from Kiliman-Djaro, described from dried specimens and not introduced into cultivation, belonging to the same class and close to *Rhipsalis Cassutha* and *R. virgata* Web.

Rhipsalis Lindbergiana K. Sch. (Monogr. Kact. p. 624), a Brazilian plant, is one of the same group and does not differ from *R. virgata* Web. except in the rose-color of its fruit. I believe that these two plants are identical specifically. Schumann was not opposed to this idea in his correspondence with Weber and was disposed to unite the two plants under *Rhipsalis virgata* of which they may constitute a variety or two on account of the difference in the relative size of the berries.

I have passed in review all the species of *Rhipsalis* from Africa. None are in my opinion indigenous to this part of the world, as all are found in the flora of America.

What modifications in nomenclature would the adoption of my opinion bring about?

Weber has settled the question for his *Rhipsalis madagascariensis* which he refers as a synonym to *Rhipsalis fasciculata* Haw.

Rhipsalis suareziانا and *R. tetragona* Web. were published at the same time. I should prefer to keep the name of the American species which seems to be the stock or source of the plants of Diego-Suarez.

For the same reason the name *R. Lindbergiana* K. Sch. should be adopted and *R. erythrocarpa* of the same author becomes a synonym, unless in the future we are peremptorily obliged to consider these plants as varieties with red fruits of

R. virgata Web., this cannot be decided without the introduction of living plants.

Rhipsalis comorensis Web. and *R. zanzibarica* Web. become synonyms of *R. Cassutha* Gaertner.

How could the American species of *Rhipsalis* become *transported* to Africa? Evidently by migratory birds. I see here birds which devour the berries of *Rhipsalis* entire. They are small, very glutinous, full of a sweet pulp, in which are small seeds, variable in number according to the species. They are not dehiscent, but at the end of two years decay and fall off at the least contact. When *Rhipsalis* is situated where small birds have access to it, it is stripped of its fruit as soon as they ripen.

We can admit at first sight the function of the intestines in the propagation of seeds. We have seen seeds of figs deposited on the summits of date-palms, where they root in the earth which collects in the axils of the leaves. The coat of the seeds in *Rhipsalis* has a hardness analogous to that of the seeds of *Ficus Carica*. The birds could also carry the seeds on their feet or on their feathers, where they would adhere for a long time. The berry, half rotten, very readily caducous, could also attach itself entire to any object which it touched.

It is to be noted that no species of the group of flat-jointed *Rhipsalis* (*Alatae*) has been found in Africa and that the species of this group almost all have the seeds very fragile. The pulp of their berries is generally not very adhesive. These two characters render very dubious their arrival in good condition after the long journey across the Atlantic.

No botanist has ever doubted the importation from America of the *Opuntias* which are naturalized throughout Central Europe, also in all of Africa and in certain Asiatic regions. No *Opuntia* found in the Old World has received the honor of a specific name.

It seems very plausible that this genus also has been propagated or distributed by birds having scattered the seed which have very bony hard coats and are very durable.

Larger animals and man himself have contributed largely to the distribution of these plants, of which the fruits are edible, if not all of good quality.

[M. Roland-Gosselin's bold explanation of the occurrence of these *Rhipsalis* species of Cactaceae in tropical Asia and Africa, the family being otherwise American in distribution, is an important contribution.—N. L. B.]

A CASE OF ABNORMAL DEVELOPMENT OF A SHORT GROWTH IN *PINUS EXCELSA*

BY ARTHUR H. GRAVES

The characteristic development in the genus *Pinus* of two sorts of shoot axes—long and short—is well known to all who are acquainted with the genus. The long growth (*Langtrieb*) is represented by the main axis or axes of the shoot system; the short growths (*Kurztriebe*) consist of much abbreviated branches which are borne on the long growth, arranged spirally upon it, and subtended by its scale-like leaves. These short growths or branches are characterized primarily by the fascicles of leaves they bear; each one, in the group of the white pines, developing normally five leaves, in a whorl-like cluster or "fascicle." Microscopical examination shows near the base of these leaves, and surrounded by them, a tiny growing point at the terminus of the short growth. Under ordinary conditions this growing point never develops further; and at the end of two or two and one half years the whole short growth is shed, in essentially the same manner as a leaf is cast from one of our deciduous trees.

Under special conditions, however, as for example when the growing point of the long growth is injured, a development of a short growth into a long growth rarely occurs.* An interesting case of this kind was recently found by the writer on a tree about 15 years old of *Pinus excelsa* Wall. in the New York Botanical Garden, and is illustrated in figure 1. The five leaves composing the original fascicle may be seen at the base of the shoot, one of them having been slightly twisted in order to show

* Engler, A., und K. Prantl. Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten insbesondere den Nutzpflanzen. 2¹: 29 note. Leipzig. 1889.